WHAT IS CLAIMED IS:

1. A semiconductor laser apparatus wherein a respective element value of the semiconductor laser apparatus is determined on the basis of relationships between respective elements of the semiconductor laser apparatus including a cavity length of the semiconductor laser apparatus and a carrier concentration of an upper cladding layer of the semiconductor laser apparatus and a photoelectric conversion efficiency or electric drive power of the semiconductor laser apparatus, for optical output power to be constant as a parameter, so that the electric drive power is vicinal to a minimum thereof or the photoelectric conversion efficiency is vicinal to a maximum thereof in correspondence to a desirable optical output power.

2. A semiconductor laser apparatus wherein a cavity length over 1000 μm is determined on the basis of a relationship of electric drive power to a range of optical output power over 50 mW, for cavity length to be constant as a parameter in a range over 1000 μm, so that the electric drive power is vicinal to a minimum thereof in correspondence to a desired optical output power.

3. A semiconductor laser apparatus according to **claim 2**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

4. A semiconductor laser apparatus according to **claim 2**, wherein the desired optical output power is within a range of 50 mW to 400 mW, and the cavity length is within a range of 1000 μm to 1600 μm.

5. A semiconductor laser apparatus according to **claim 2**, wherein the desired optical output power is within a range of 50 mW to 200 mW, and the cavity length is within a range of 1000 μm to 1400 μm.

6. A semiconductor laser module comprising:

a semiconductor laser apparatus according to **claim 2**;

an optical fiber for conducting outside laser light projected from the semiconductor laser apparatus; and

an optical coupling lens system for an optical coupling between the semiconductor laser apparatus and the optical fiber.

7. A semiconductor laser module according to **claim 6**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an optical fiber grating formed in a vicinity of an incidence end of the optical fiber.

8. A semiconductor laser module according to **claim 6**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an isolator disposed in the optical coupling lens system, for suppressing an incidence of reflection return light from an optical fiber side.

9. A semiconductor laser apparatus wherein a cavity length is determined on the basis of a relationship of a photoelectric conversion efficiency to a range of cavity length over 1000 μm, for optical output power to be constant as a parameter in a range over 50 mW, so that the photoelectric conversion efficiency is vicinal to a maximum thereof in correspondence to a desirable optical output power.

10. A semiconductor laser apparatus according to **claim 9**, wherein the cavity length is determined on the basis of an approximation expression making the photoelectric conversion efficiency maximal in correspondence to the desirable optical output power.

11. A semiconductor laser apparatus according to **claim 9**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

12. A semiconductor laser apparatus according to **claim 9**, wherein the desired optical output power is within a range of 50 mW to 400 mW, and the cavity length is within a range of 1000 μm to 1600 μm.

13. A semiconductor laser apparatus according to **claim 9**, wherein the desired optical output power is within a range of 50 mW to 200 mW, and the cavity length is within a range of 1000 μm to 1400 μm.

14. A semiconductor laser module comprising:

a semiconductor laser apparatus according to **claim 9**;

an optical fiber for conducting outside laser light projected from the semiconductor laser apparatus; and

an optical coupling lens system for an optical coupling between the semiconductor laser apparatus and the optical fiber.

15. A semiconductor laser module according to **claim 14**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an optical fiber grating formed in a vicinity of an incidence end of the optical fiber.

16. A semiconductor laser module according to **claim 14**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an isolator disposed in the optical coupling lens system, for suppressing an incidence of reflection return light from an optical fiber side.

17. A semiconductor laser apparatus wherein a cavity length over 1000 μm is determined on the basis of a relationship of electric drive power to a range of cavity

length over 1000 μm, for optical output power to be constant as a parameter in a range over 50 mW, so that the electric drive power is vicinal to a minimum thereof in correspondence to a desirable optical output power.

18. A semiconductor laser apparatus according to **claim 17**, wherein the cavity length is determined on the basis of an approximation expression making the electric drive power minimal in correspondence to the desirable optical output power.

19. A semiconductor laser apparatus according **claim 17**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

20. A semiconductor laser apparatus according to **claim 17**, wherein the desirable optical output power is within a range of 50 mW to 400 mW, and the cavity length is within a range of 1000 μm to 1600 μm.

21. A semiconductor laser apparatus according to **claim 17**, wherein the desirable optical output power is within a range of 50 mW to 200 mW, and the cavity length is within a range of 1000 μm to 1400 μm.

22. A semiconductor laser module comprising:

a semiconductor laser apparatus according to **claim 17**;

an optical fiber for conducting outside laser light projected from the semiconductor laser apparatus; and

an optical coupling lens system for an optical coupling between the semiconductor laser apparatus and the optical fiber.

23. A semiconductor laser module according to **claim 22**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an optical fiber grating formed in a vicinity of an incidence end of the optical

fiber.

24. A semiconductor laser module according to **claim 22**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an isolator disposed in the optical coupling lens system, for suppressing an incidence of reflection return light from an optical fiber side.

25. A semiconductor laser apparatus wherein an upper cladding layer has an impurity carrier concentration determined on the basis of a relationship of a photoelectric conversion efficiency or electric drive power to the impurity carrier concentration of the upper cladding layer, for optical output power and cavity length to be constant as parameters, so that the electric drive power is vicinal to a minimum thereof or the photoelectric conversion efficiency is vicinal to a maximum thereof in correspondence to a desirable optical output power.

26. A semiconductor laser module comprising:

a semiconductor laser apparatus according to **claim 25**;

an optical fiber for conducting outside laser light projected from the semiconductor laser apparatus; and

an optical coupling lens system for an optical coupling between the semiconductor laser apparatus and the optical fiber.

27. A semiconductor laser module according to **claim 26**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an optical fiber grating formed in a vicinity of an incidence end of the optical fiber.

28. A semiconductor laser module according to **claim 26**, further comprising:

a temperature controller for controlling a temperature of the semiconductor laser apparatus; and

an isolator disposed in the optical coupling lens system, for suppressing an incidence of reflection return light from an optical fiber side.

29. A fabrication method for a semiconductor laser apparatus, comprising:

acquiring relationships between respective elements of the semiconductor laser apparatus including a cavity length of the semiconductor laser apparatus and a carrier concentration of an upper cladding layer of the semiconductor laser apparatus and a photoelectric conversion efficiency or electric drive power of the semiconductor laser apparatus, for optical output power to be constant as a parameter;

determining a respective element value of the semiconductor laser apparatus to be determined on the basis of the relationships acquired by the relationship acquiring step, so that the electric drive power is vicinal to a minimum thereof or the photoelectric conversion efficiency is vicinal to a maximum thereof in correspondence to a desirable optical output power; and

forming the semiconductor laser apparatus having the respective element value determined by the element value determining step.

30. A fabrication method for a semiconductor laser apparatus according to **claim 29**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

31. A fabrication method for a semiconductor laser apparatus, comprising:

acquiring a relationship of electric drive power to a range of optical output power over 50 mW, for cavity length to be constant as a parameter in a range over 1000 μm;

determining a cavity length over 1000 μm to be determined on the basis of the relationship acquired by the relationship acquiring step, so that the electric drive power is vicinal to a minimum thereof in correspondence to a desirable optical output power; and

forming the semiconductor laser apparatus having the cavity length determined

by the cavity length determining step.

32. A fabrication method for a semiconductor laser apparatus according to **claim 31**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

33. A fabrication method for a semiconductor laser apparatus, comprising:

acquiring a relationship of a photoelectric conversion efficiency to a range of cavity length over 1000 μm, for optical output power to be constant as a parameter in a range over 50 mW;

determining a cavity length to be determined on the basis of the relationship acquired by the relationship acquiring step, so that the photoelectric conversion efficiency is vicinal to a maximum thereof in correspondence to a desirable optical output power; and

forming the semiconductor laser apparatus having the cavity length determined by the cavity length determining step.

34. A fabrication method for a semiconductor laser apparatus according to **claim 33**, further comprising:

determining an approximation expression for making the photoelectric conversion efficiency maximal in correspondence to the desirable optical output power, on the basis of the relationship acquired by the relationship acquiring step; and

determining the cavity length on the basis of the approximation expression.

35. A fabrication method for a semiconductor laser apparatus according to **claim 33**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

36. A fabrication method for a semiconductor laser apparatus, comprising:

acquiring a relationship of electric drive power to a range of cavity length over

1000 μm, for optical output power to be constant as a parameter in a range over 50 mW;

determining a cavity length over 1000 μm to be determined on the basis of the relationship acquired by the relationship acquiring step, so that the electric drive power is vicinal to a minimum thereof in correspondence to a desirable optical output power; and

forming the semiconductor laser apparatus having the cavity length determined by the cavity length determining step.

37. A fabrication method for a semiconductor laser apparatus according to **claim 36**, further comprising:

determining an approximation expression for making the electric drive power minimal in correspondence to the desirable optical output power, on the basis of the relationship acquired by the relationship acquiring step; and

determining the cavity length on the basis of the approximation expression.

38. A fabrication method for a semiconductor laser apparatus according to **claim 36**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

39. A fabrication method for a semiconductor laser apparatus, comprising:

acquiring a relationship of electric drive power to an impurity carrier concentration of an upper cladding layer, for optical output power and cavity length to be constant as parameters;

determining the impurity carrier concentration to be determined on the basis of the relationship acquired by the relationship acquiring step, so that the electric drive power is vicinal to a minimum thereof in correspondence to a desirable optical output power; and

forming the semiconductor laser apparatus with the upper cladding layer having the impurity carrier concentration thereof set to the impurity carrier concentration determined by the carrier concentration determining step.

40. A fabrication method for a semiconductor laser apparatus according to **claim 39**, wherein an active layer forming a cavity with the cavity length has a strain multiple quantum well structure.

41. A semiconductor laser comprising:

a resonator cavity having a front facet, a back facet, and a length L in the range of approximately 900 μm to approximately 1800 μm;

an active layer disposed within the resonator cavity and being electrically coupled to two electrodes which receive an electrical bias potential from a power supply and which inject electrical current to the active layer;

a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%;

a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%;

a power supply coupled to said electrodes and applying an amount of power which causes the semiconductor laser to operate with an optical output power level P_{OUT} less than or equal to a specified upper bound and greater than or equal to a specified lower bound, the specified upper and lower bounds being based on the cavity length,

the specified lower bound having a value of 50 mW for cavity lengths between approximately 1000 μm and 1380 μm, a value equal to the quantity (1mW)*[(L-1280μm)/2μm)] for cavity lengths of 1380 μm to 1480 μm, a value equal to the quantity (1mW)*[(L-1260 μm)/2.2μm)] for cavity lengths of 1480 μm to 1700 μm, a value equal to the quantity (2mW)*[(L-1600 μm)/1μm)] for cavity lengths of 1700 μm to 1750 μm, and a value of (3mW)*[(L-1510 μm)/2μm)] for cavity lengths of 1750 μm to approximately 1770 μm, and

the specified upper bound having a value equal to the quantity (2mW)*[(L-950μm)/1μm)] for cavity lengths of approximately 1000 μm to 1050 μm, a value equal to the quantity (2mW)*[(L-750 μm)/3μm)] for cavity lengths of 1050 μm to 1200 μm, a value equal to the quantity (2mW)*[(L-450 μm)/5μm)]

for cavity lengths of 1200 μm to 1350 μm, a value equal to the quantity (3mW)*[(L-150 μm)/10μm)] for cavity lengths of 1350 μm to 1450 μm, and a value equal to the quantity 390 mW for cavity lengths of 1450 μm to approximately 1770 μm.

42. The semiconductor laser of **Claim 41** wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately {2μm*(P_{OUT}/1mW) +1280 μm}.

43. The semiconductor laser of **Claim 41** wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately {1μm*(P_{OUT}/2mW)+950 μm} and approximately {2.2μm*(P_{OUT}/1mW)+1260 μm }.

44. The semiconductor laser of **Claim 41** wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately {3μm*(P_{OUT}/2mW)+750 μm}and approximately {1μm*(P_{OUT}/2mW)+1600μm}.

45. The semiconductor laser of **Claim 41** wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately {5μm*(P_{OUT}/2mW)+450μm} and approximately 1750 μm.

46. The semiconductor laser of **Claim 41** wherein the amount of electrical potential applied to said electrodes causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW)+1510\ \mu m\}$.

47. The semiconductor laser of **Claim 41** wherein the length L is in the range of approximately 1000 μm to approximately 1100 μm, and wherein an amount of electrical potential applied to said electrodes which causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 50 mW and approximately 100 mW.

48. The semiconductor laser of **Claim 41** wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm, and wherein an amount of electrical potential applied to said electrodes which causes the semiconductor laser to operate at an optical output power level P_{OUT} of between approximately 200 mW and approximately 300 mW.

49. A semiconductor laser comprising:

a resonator cavity having a front facet, a back facet, and a length L in the range of approximately 900 μm to approximately 1800 μm;

an active layer disposed within the resonator cavity;

a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%;

a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%;

an optical output power level P_{OUT} less than or equal to a specified upper bound and greater than or equal to a specified lower bound, the specified upper and

lower bounds being based on the cavity length,

the specified lower bound having a value of 50 mW for cavity lengths between approximately 1000 um and 1380 um, a value equal to the quantity (1mW)*[(L-1280 μm)/2μm)] for cavity lengths of 1380 μm to 1480 μm, a value equal to the quantity (1mW)*[(L-1260 μm)/2.2μm)] for cavity lengths of 1480 μm to 1700 μm, a value equal to the quantity (2mW)*[(L-1600 μm)/1μm)] for cavity lengths of 1700 μm to 1750 μm, and a value of (3mW)*[(L-1510 μm)/2μm)] for cavity lengths of 1750 μm to approximately 1770 μm, and

the specified upper bound having a value equal to the quantity (2mW)*[(L-950 μm)/1μm)] for cavity lengths of approximately 1000 μm to 1050 μm, a value equal to the quantity (2mW)*[(L-750 μm)/3μm)] for cavity lengths of 1050 μm to 1200 μm, a value equal to the quantity (2mW)*[(L-450μm)/5μm)] for cavity lengths of 1200 μm to 1350 μm, a value equal to the quantity (3mW)*[(L-150 μm)/10μm)] for cavity lengths of 1350 μm to 1450 μm, and a value equal to the quantity 390 mW for cavity lengths of 1450 μm to approximately 1770 μm.

50. The semiconductor laser of **Claim 49** wherein the optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately {2μm*(P_{OUT}/1mW) +1280 μm}.

51. The semiconductor laser of **Claim 49** wherein the optical output power level P_{OUT} is between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately {1μm*(P_{OUT}/2mW)+950 μm} and approximately {2.2μm*(P_{OUT}/1mW)+1260μm}.

52. The semiconductor laser of **Claim 49** wherein the optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately

$\{3\mu m*(P_{OUT}/2mW)+750\ \mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW)+1600\mu m\}$.

53. The semiconductor laser of **Claim 49** wherein the optical output power level P_{OUT} is between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately $\{5\mu m*(P_{OUT}/2mW)+450\mu m\}$ and approximately 1750 μm.

54. The semiconductor laser of **Claim 49** wherein the optical output power level P_{OUT} is between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW)+1510\ \mu m\}$.

55. The semiconductor laser of **Claim 49** wherein the length L is in the range of approximately 1000 μm to approximately 1100 μm, and wherein the optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW.

56. The semiconductor laser of **Claim 49** wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm, and wherein the optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW.

57. A method of operating a semiconductor laser, the semiconductor laser including a resonator cavity having a front facet, a back facet, and a length L between facets in the range of approximately 900 μm to approximately 1800 μm, the semiconductor laser further including an active layer disposed within the resonator cavity, a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%, and a high reflectance coating disposed on the back facet and having a reflectivity of more than approximately 80%, said method comprising:

operating the semiconductor laser at an optical output power level P_{OUT} which is less than or equal to a specified upper bound and which is greater than or equal to a specified lower bound based on the cavity length, the specified upper and lower bounds being based on the cavity length,

the specified lower bound having a value of 50 mW for cavity lengths between approximately 1000 um and 1380 um, a value equal to the quantity $(1mW)*[(L-1280\mu m)/2\mu m)]$ for cavity lengths of 1380 μm to 1480 μm, a value equal to the quantity $(1mW)*[(L-1260\ \mu m)/2.2\mu m)]$ for cavity lengths of 1480 μm to 1700 μm, a value equal to the quantity $(2mW)*[(L-1600\ \mu m)/1\mu m)]$ for cavity lengths of 1700 μm to 1750 μm, and a value of $(3mW)*[(L-1510\ \mu m)/2\mu m)]$ for cavity lengths of 1750 μm to approximately 1770 μm, and

the specified upper bound having a value equal to the quantity $(2mW)*[(L-950\mu m)/1\mu m)]$ for cavity lengths of approximately 1000 μm to 1050 μm, a value equal to the quantity $(2mW)*[(L-750\ \mu m)/3\mu m)]$ for cavity lengths of 1050 μm to 1200 μm, a value equal to the quantity $(2mW)*[(L-450\ \mu m)/5\mu m)]$ for cavity lengths of 1200 μm to 1350 μm, a value equal to the quantity $(3mW)*[(L-150\ \mu m)/10\mu m)]$ for cavity lengths of 1350 μm to 1450 μm, and a value equal to the quantity 390 mW for cavity lengths of 1450 μm to approximately 1770 μm.

58. The method of **Claim 57** wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately $\{2\mu m*(P_{OUT}/1mW) +1280\ \mu m\}$.

59. The method of **Claim 57** wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately $\{1\mu m*(P_{OUT}/2mW)+950\ \mu m\}$ and approximately $\{2.2\mu m*(P_{OUT}/1mW)+1260\ \mu m\}$.

60. The method of **Claim 57** wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately $\{3\mu m*(P_{OUT}/2mW)+750\ \mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW)+1600\mu m\}$.

61. The method of **Claim 57** wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately $\{5\mu m*(P_{OUT}/2mW)+450\mu m\}$ and approximately 1750 μm.

62. The method of **Claim 57** wherein the laser is operated at an optical output power level P_{OUT} which is between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW)+1510\ \mu m\}$.

63. The method of **Claim 57** wherein the length L is in the range of approximately 1000 μm to approximately 1100 μm, and wherein the optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW.

64. The method of **Claim 57** wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm, and wherein the optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW.

65. A method of selecting the cavity length of semiconductor laser to provide reduced power consumption or increased photoelectric conversion efficiency for a selected output power P_{OUT} in the range between approximately 50mW and approximately 400 mW, the semiconductor laser including a resonator cavity having a front facet, a back facet, an active layer disposed within the resonator cavity, a low reflectance coating disposed on the front facet having a reflectivity of less than approximately 4%, and a high reflectance coating disposed on the back facet and

having a reflectivity of more than approximately 80%, the cavity length being between the front and back facets, said method comprising:

selecting the cavity length to be within one of four ranges depending upon the value of the selected output power P_{OUT},

the first range being between approximately 1000 μm and approximately $\{2\mu m*(P_{OUT}/1mW) +1280\ \mu m\}$ for values of P_{OUT} between approximately 50 mW and approximately 100 mW,

the second range being between approximately $\{1\mu m*(P_{OUT}/2mW)+950\mu m\}$ and approximately $\{2.2\mu m*(P_{OUT}/1mW) +1260\ \mu m\}$ for values of P_{OUT} between approximately 100 mW and approximately 200 mW,

the third range being between approximately $\{3\mu m*(P_{OUT}/2mW)+750\mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW) +1600\ \mu m\}$ for values of P_{OUT} between approximately 200 mW and approximately 300 mW, and

the fourth range being between approximately $\{5\mu m*(P_{OUT}/2mW)+450\ \mu m\}$ and approximately 1750 μm for values of P_{OUT} between approximately 300 mW and approximately 360 mW, and

the fifth range being between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW) +1510\ \mu m\}$ for values of P_{OUT} between approximately 360 mW and approximately 390 mW.

66. The method of **Claim 65** wherein the selected optical output power P_{OUT} is between approximately 50 mW and approximately 100 mW, and wherein the cavity length is in the range between approximately 1000 μm and approximately $\{2\mu m*(P_{OUT}/1mW) +1280\ \mu m\}$.

67. The method of **Claim 65** wherein the selected optical output power P_{OUT} is between approximately 100 mW and approximately 200 mW, and wherein the cavity length is in the range between approximately $\{1\mu m*(P_{OUT}/2mW)+950\ \mu m\}$ and approximately $\{2.2\mu m*(P_{OUT}/1mW)+1260\mu m\}$.

68. The method of **Claim 65** wherein the selected optical output power P_{OUT} is between approximately 200 mW and approximately 300 mW, and wherein the cavity length is in the range between approximately $\{3\mu m*(P_{OUT}/2mW)+750\ \mu m\}$ and approximately $\{1\mu m*(P_{OUT}/2mW)+1600\ \mu m\}$.

69. The method of **Claim 65** wherein the selected optical output power P_{OUT} is between approximately 300 mW and approximately 360 mW, and wherein the cavity length is in the range between approximately $\{5\mu m*(P_{OUT}/2mW)+450\mu m\}$ and approximately 1750 μm.

70. The method of **Claim 65** wherein the selected optical output power P_{OUT} is between approximately 360 mW and approximately 390 mW, and wherein the cavity length is in the range between approximately $\{10\mu m*(P_{OUT}/3mW)+150\ \mu m\}$ and approximately $\{2\mu m*(P_{OUT}/3mW)+1510\ \mu m\}$.

71. The method of **Claim 65** wherein the selected optical output power level P_{OUT} is between approximately 50 mW and approximately 100 mW, and wherein the length L is selected in the range of approximately 1000 μm to approximately 1100 μm.

72. The method of **Claim 65** wherein the selected optical output power level P_{OUT} is between approximately 200 mW and approximately 300 mW, and wherein the length L is in the range of approximately 1200 μm to approximately 1600 μm.